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PATENT SPECIFICATION

NO DRAWINGS

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COMPLETE SPECIFICATION

Methods and Compositions for preparing Yeast-Leavened Baked Goods

We, J. R. SHORT MILLING COMPANY, a corporation of the State of Illinois, United States of America, of 20 North Wacker Drive, Chicago, Illinois, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the production of bread and other yeast-leavened baked goods and particularly to an improved method and composition for obtaining better body and flavor in baked products, especially in products prepared by procedures employing an aqueous brew or broth.

In recent years, the baking industry has found it necessary, because of increasing costs of production and distribution, to adopt baking procedures employing yeast-fermented aqueous brews or broths. Of such procedures, the one most commonly encountered is the "continuous-mix" method described in U.K. Specifications 808,836 and 735,184 and in which an aqueous brew, fermented for flavor production, is continuously combined with flour and shortening to form a preliminary dough mixture which is then passed continuously through a high speed dough developer to provide a developed dough at a high continuous rate. Similar processes are sometimes employed which commence with a brew or broth and employ this to form dough on a batch basis, rather than continuously. Though such processes, and particularly the continuous-mix method, have been widely adopted in the industry, and must be recognized as successful, the baked goods so prepared have certain characteristics which, at least in the eyes of many consumers, are highly undesirable.

Foremost among these undesirable characteristics is an overall deficiency in flavor. On the one hand, the finished product frequently has what is usually characterized as a "chemical flavor" apparently resulting from use of the brew or broth, and, in the case of the continuous-mix method, from the relatively high temperatures of the preliminary dough mixture and of the emerging developed dough. On the other hand, the finished product usually lacks the "bread flavors" characteristic of baked goods made by the older batch methods. The next most important undesirable characteristic of baked goods produced by the brew or broth procedures is a deficiency in body, that is, the ability of the crumb to spring back after being subjected to pressure. Particularly in the case of white bread produced by the continuous-mix method, the product is excessively fragile, tending to collapse during baking, and in all events lacking the internal tenacity and strength of side walls characteristic of bread produced by batch methods.

While a number of proposals have been made heretofore to alleviate such disadvantages, none has proved entirely satisfactory. Among such proposals is the method described in U.S. Specification 1,005,804. In that method, an enzyme-peroxidizable fat and a lipoxidase-bearing material are separately incorporated in at least a portion of the water for the brew or broth, the resulting aqueous composition is agitated in such fashion that the fat is peroxidized by the action of the lipoxidase, and the dough-making and baking procedure then continued with the enzyme-peroxidized fat remaining in the dough to generate flavor. Though the method described in Specification 1,005,804 is now widely used, difficulties have been encountered because of the requirement for separate introduction of the fat and the enzymatically active material. Some plants have found the separate addition to be burdensome, particularly in view of the limited manpower available in continuous-mix plants. In other instances, with relatively unskilled labor, the additives have been impro-

perly introduced, or employed in incorrect proportions, with attendant failure to achieve the desired improvement in the baked goods.

It is a general object of this invention to accomplish a marked improvement in both the flavor and body of baked goods, and especially those prepared by procedures employing a brew or broth, and to do this without requiring the baker to use more than a single additive composition.

According to the invention there is provided an improvement in the method for producing baked goods by preparing an aqueous liquid yeast-fermented composition in the nature of a brew or broth, mixing the liquid composition with dough-forming ingredients including at least flour and shortening to provide a preliminary dough mixture, working the dough mixture to develop a completed dough, and proofing and baking the dough, the improvement comprising adding to at least part of the water for the liquid composition a free-flowing uniform admixture of a particulate solid active lipoxidase-bearing material, an enzyme peroxidizable fat, and a finely particulate edible extender material which is inert with respect to said lipoxidase-bearing material and to said fat, said fat being present in said/admixture in the form of a thin film on the surfaces of the solid particles of said admixture, said lipoxidase-bearing material constituting 5—85% of the total weight of said admixture, said extender material constituting 10—70% of the total weight of said admixture, and said enzyme-peroxidizable fat constituting 3—30% of the total weight of said admixture; and agitating the resulting mixture to distribute the particles of said admixture through the water and to cause at least a major proportion of said fat to be removed from said solid particles and dispersed in the water to form an oil-in-water emulsion which is markedly more stable than would be the case if the fat were introduced separately and in which the dispersed fat is more finely subdivided than if it were separately introduced, said admixture being employed in a proportion which provides an amount of fat equal to 0.025—0.3% of the total weight of flour employed.

A marked improvement in both body and flavor of baked goods prepared by the various brew procedures can be achieved by the method according to the invention. Since both the fat and the enzyme source are provided in a single composition, the baker need handle and measure only one additive, so that the chances for error are minimized. Once the additive composition has been introduced into the brew water, and the water then agitated to achieve dispersion of the particles, the fat is removed from the carrier particles and promptly and effectively dispersed as an oil-in-water emulsion so that, with further agitation, the lipoxidase causes the dispersed oil to be peroxidized. All of the components of the additive composition, including the now-peroxidized oil, then remain in the brew or broth and are thus introduced into the dough prepared therewith.

Surprisingly, the use of such a " single package " composition, including both the fat and the enzyme source in uniform admixture, results in a far superior dispersion of the fat in the brew water than is possible when the fat and the enzyme source are separately added. Thus, when the compositions of this invention have been agitated in water to effect dispersion of the fat, and it is desired to recover the fat from the aqueous dispersion for analytical purposes, for example, simple centrifuging and like procedures are ineffective, the emulsion being so exceedingly stable that it is necessary to resort to use of a fat solvent such as diethyl ether in order to recover the fat. Though the precise reasons for this improvement in dispersion of the fat have not yet been fully determined, it appears that presence of the fat in the form of a thin film on the large total surface area presented by the solid particles favors prompt emulsification. Equally surprising is the fact that, though the particles of enzymatically active material are in direct contact with the fat, presence of the fat does not impede extraction of the enzyme by the water. Finally, the compositions employed in practicing the invention are surprisingly stable, both against rancidity and against loss of enzyme activity.

The fats useful in accordance with the invention are those which can be peroxidized by enzymes. Thus, there can be employed any unsaturated edible fat containing linoleic, linolenic, or arachadonic acid, alone or in combination. Edible oils of vegetable origin are suitable, including soybean oil, cottonseed oil, corn oil, peanut oil, safflower oil, poppyseed oil, sunflower oil, wheat germ oil, sesame oil, and oiticica oil and margarines made therefrom. Peroxidizable animal fats can be used, including soft lards, margarines containing animal fats, oils extracted from animal skins, and refined marine oils. Various combinations of solid fats and oils, formulated for proper fluidity, can be employed, a mixture of lard with 10—50% by weight cottonseed oil being typical. In general, higher quality, more refined fats yield superior results.

As the extender, any finely particulate edible material which is inert with respect to the fat and to the enzymatically active material can be employed. Partially gelatinized or partially dextrinized corn endosperm flour is particularly suitable, as is also wheat farina. Any of the cereal flours, such as those from wheat, corn, milo maize and sorghum, can be used. Noncereal flours, such as potato flour and tapioca flour, are also suitable. Soybean materials, such as flakes, from which the oil has been extracted can be used. The starches, including particularly wheat starch and corn

starch, can be used. Various particulate solid protein materials are suitable, including powdered gelatin, soybean protein, and wheat gluten. Suitable inorganic materials can also be used, such as calcium carbonate, tricalcium phosphate and calcium sulfate. The carrier material must be finely particulate. Materials having an average particle size of 50—175 microns are suitable, and an average particle size in the range of 75—150 microns is particularly advantageous. Rather than a single extender material, a combination of two or more different extender materials can be employed.

Lipoxidase in any edible form, suitable for introduction into an aqueous system, can be used. For practical purposes, particulate legume materials, hereafter referred to generically as flours, represent the best enzymatic materials for use in accordance with the invention. Thus, enzymatically active soybean flour, soybean meal and soybean flakes are all excellent lipoxidase-containing materials for use in the invention. Equivalent materials derived from peas, peanuts, lima beans, navy beans and lentils are suitable. When a naturally oil-rich material such as soybean flour is employed, it can be either full-fat, low-fat or fat-free, so long as it exhibits adequate lipoxidase activity. Mixtures of two or more lipoxidase source materials can be employed.

Compositions prepared in accordance with the invention are uniform and free-flowing, despite the relatively high fat content. In this regard, both the relative proportions of the extender, fat and enzyme source, and the physical disposition of the three components relative to each other, are of special significance. The fat coated on the solid particles can constitute from as little as 3% by weight of the total composition to as much as 30% by weight, and proportions of fat in the range of 5—15% by weight are particularly advantageous. The extender is employed in an amount equal to 10—70% by weight, and the lipoxidase-bearing material constitutes 5—85% by weight.

The compositions can be such that at least the greater proportion of the fat employed, other than any native fat in the enzyme material or in the extender, is present on the particles of the extender. On the other hand, the fat can be supported both by the extender and by the enzyme material. Though the fat is mainly present as a coating or film on the extender particles, or on the particles of both the extender and the lipoxidase material, a significant amount of absorption of the fat by the particles also occurs and this can be minimized or increased, as desired, by choice of the particulate materials, by adjusting the moisture content of the particulate materials, or by vacuum treatment to remove entrapped air from the particles prior to introduction of the fat.

Advantageously, the compositions are prepared by first mixing the fat and the particulate extender, employing adequate agitation to assure distribution of the fat over the surfaces of the extender particles, and then introducing the enzyme material and subjecting the composition to limited mixing adequate only to achieve uniformity of the mixture. Excessive agitation after introduction of the enzymatic material tends to inhibit the enzyme activity thereof. In accordance with this procedure, a composition is obtained in which the fat is carried at least predominantly by the particles of the extender, and only a minimum amount of fat is deposited on the particles of the enzyme material.

Alternatively, the compositions can be prepared by first mixing the extender and the enzymatic material and then adding the fat, agitation then being continued to distribute the fat on the particles of both the extender and the enzymatic material.

Compositions in accordance with the invention can be packed, shipped and stored in conventional bags and remain stable and free flowing even after prolonged storage. Despite their relatively high fat content, the compositions are easily handled, measured and dispensed and, from the standpoint of convenience to the baker, are like the many particulate and powdered materials with which the baker is familiar. Since both the fat and the enzyme source material are present in predetermined proportions in a single composition, the baker need only measure out a prescribed quantity of the single composition, thus being free of the manipulative complexities involved in the method described in aforementioned specification 1,005,804.

The ability of the compositions to survive long storage without the fat content becoming rancid is particularly important. Surprisingly good shelf life is obtained when the enzymatically active material employed is full-fat soybean flour, and this is true even when the fat employed is an oil, such as soybean oil, which tends rather strongly to develop rancidity during storage. Though the reasons for this ability to survive prolonged storage are not fully understood, it appears that the full-fat soybean flour contains native ingredients, including tocopherols, carotinoid pigments, and lecithin, which exhibit an anti-oxidant effect to inhibit the development of rancidity.

The method of this invention is most advantageous when employed in baked goods procedures which commence with a yeast-fermented aqueous brew or broth. In such cases, the composition comprising the fat, extender and enzyme source is added to all or part of the brew water and the aqueous mixture then agitated to first emulsify the fat and then peroxidize the fat as a result of action of the lipoxidase, the agitation being sufficiently vigorous to introduce enough air to supply the

oxygen required for enzyme-peroxidation. The method is also useful in conventional batch procedures for preparing bread and other baked goods. In such procedures the composition including the fat, extender and enzyme source is simply dispersed in all or a portion of the water to be used in making the dought, and the resulting dispersion agitated to disperse the fat and acomplish enzyme peroxidation. In all events, whether employing a brew or a more conventional batch procedure, agitation is carried out for from 10 minutes to 6 hours while maintaining the liquid at 40—110°F. and a pH of at least 4.0 but not materially above 8.5.

Following introduction of the additive composition into the water, agitation under the conditions just mentioned is effective both to cause at least a major portion of the fat to be removed from the supporting particles and dispersed in the water as an oil-in-water emulsion, and to peroxidize the fat. So far as promoting enzyme-peroxidation is concerned, the present method has proved markedly superior to the procedure of aforementioned Specification 1,005,804, where the fat in liquid form is introduced into the water independently. Such superiority arises from an increased exposure of the fat to the oxygen and enzyme required for peroxidation. First, with the fat initially exposed as a thin film on the surfaces of the solid particles, emulsification occurs rapidly and the dispersed fat is extremely finely subdivided, rather than being present as relatively large globules, the resulting emulsification being very stable and difficult to break even for analytical purposes. Next, even that fat remaining on the surfaces of the carrier particles is efficiently exposed for contact with the oxygen and lipoxidase, so that peroxidation proceeds both in the emulsified fat and in the fat remaining on the carrier material. The fat is apparently removed from the carrier particles more or less progressively so that, as agitation proceeds, additional fat is emulsified for peroxidation, or further peroxidation, and new fat is thus exposed at the surfaces of the carrier particles. As an overall result, the method can be practiced successfully with very small porportions of fat, and it is preferred to employ an amount of fat below even the lower limit allowable in the method of aforementioned Specification 1,005,804.

In general, the additive composition is employed in an amount capable of introducing into the aqueous medium a quantity of total fat, including both the fat disposed on the particulate materials and any native fat supplied by the enzyme source material, equal to 0.025—0.300% of the total weight of flour to be employed in the dough. From the standpoints of practicality, economy and optium results, the total quantity of fat is kept in the range of 0.040—0.100% of the flour weight.

The following examples illustrate typical bread improver compositions in accordance with the invention, and typical methods for preparing them.

Example 1

Compositions having the formulations tabulated below were prepared in a conventional mixing apparatus of 100 lb. capacity known to the trade as a twin shell tumbling mixer and supplied by Patterson-Kelley Co., East Stroudsburg, Pennsylvania, the mixer being equipped with an "intensifier bar" for the introduction of liquids and which can be rotated to provide increased agitation. For each composition, the carrier material was first placed in the mixer and, with the mixer operating, the fat was then introduced via the intensifier bar, agitation being continued for 10 minutes to ensure uniform distribution of the fat on the surfaces of the carrier particles. The lipoxidase-bearing material was then introduced, and mixing continued for 10 minutes, with the intensifier bar driven, to accomplish uniform mixing of the lipoxidase-bearing material with the fat-coated carrier material.

Composition	Extender		Fat		Enzyme Source	
	Material	% by Wt.	Material	% by Wt.	Material	% by Wt.
A	Partially dextrinized corn endosperm flour, av. particle size 100—150 microns	68.2	Safflower oil	6.8	Full fat, enzyme active soybean flour	25.0
B	do	66.2	do	8.8	do	25.0
C	do	40.0	Refined soybean oil	5.0	do	55.0
D	do	66.5	do	13.5	do	20.0
E	do	66.5	Refined cottonseed oil	13.5	do	20.0
F	do	75.0	do	20.0	do	5.0
G	Food grade corn starch	68.2	Safflower oil	6.8	do	25.0
H	Wheat flower	68.2	Refined cottonseed oil	6.8	do	25.0
I	Food grade calcium sulfate, av. particle size 75—150 microns	68.2	Refined soybean oil	6.8	do	25.0
J	Fat-free (extracted), enzymatically inactive soybean flakes	76.5	do	3.5	do	20.0
K	do	57.0	do	28.0	do	15.0

EXAMPLE 2

Twenty-five parts by weight full fat soybean flour and 65 parts by weight partially dextrinized corn endosperm flour (average particle size 100—150 microns) were combined in a ribbon blender and mixed for 10 minutes to provide a uniform blend. With the mixer operating, 10 parts by weight of soybean oil was then added over a 10-minute period, after which mixing was continued for an additional 10 minutes. In the resulting composition, the soybean oil is supported both by the particles of corn flour, employed as the extender, and by the particles of soybean flour, employed as the lipoxidase source.

To provide a composition of especially high added fat content, the procedure is repeated, using 55 parts by weight of the corn flour, 20 parts by weight of extracted, essentially fat-free, enzymatically active soy flour, and 25 parts by weight of soybean oil.

Compositions prepared in accordance with the foregoing examples have been stored at room temperature for periods as long as 15 months without developing observable rancidity or exhibiting undue loss in lipoxidase activity. The compositions are uniform and, though exhibiting a tendency to clump at higher fat concentrations, are free-flowing and easily measured and dispensed.

The following examples illustrate typical method embodiments of the invention.

EXAMPLE 3

Employing the AMFLO pilot plant maintained and operated at Richmond, Virginia, by the American Machine & Foundry Co. and designed to reproduce on pilot plant scale the continuous-mix procedure now commonly carried out in the baking industry in plants embodying AMFLO equipment, three runs of white bread were made, Run 1 serving as control and employing no bread improver composition, and Runs 2 and 3 employing Compositions A and B of Example 1, respectively. In use of this pilot plant, the brew ingredients are mixed and fermented for 2—1/2 hrs. at 80—82°F. as an initial step (hereinafter "Phase 1"), salt and additional water then being added (hereinafter "Phase 2") preparatory to transfer of the brew to the holding tank, the brew is then mixed with the sugar shortening, oxidants, and the flour not already incorporated in the brew to form a preliminary dough mixture (hereinafter "Phase 3") the dough is then developed, and the developed dough is divided, proofed and baked.

The formula for control Run 1 was as follows:

Ingredient	Quantity in Grams			% by Wt., Based on Total Flour
	Phase 1	Phase 2	Phase 3	
Water	30,000	—	—	60.0
Flour	12,500	—	—	25.0
Yeast	1,500	—	—	3.0
Yeast food	250	—	—	0.5
Mold inhibitor	50	—	—	0.1
Sugar	500	—	—	1.0
Bread softener	50	—	—	0.1
Water	—	1,500	—	3.0
Salt	—	1,000	—	2.0
Water	—	—	3,000	6.0
Sugar	—	—	3,000	6.0
Flour	—	—	37,500	75.0
Lard	—	—	1,500	3.0
Oxidant	—	—	(Note 1)	(Note 1)

Note 1: 48 ppm Potassium Bromate and 12 ppm. Potassium Iodate, based on total flour.

Emerging dough temperature at the developer was 103°F., and the developer was operated at 200 r.p.m. Sealing weight was 19 oz. The developed dough was divided into 19 oz. pieces, proofed for 27 min. at 108°F. and a relative humidity of 88%, and baked for 16 min. at 460°F.

Run 2 differed from control Run 1 in that, preliminary to Phase 1 of brew preparation, 500 g. of Composition A of Example 1 was dispersed in 4,000 g. of the water for Phase 1 by mixing with a high speed rotary agitator for 12 min, at a pH of 5.5, the resulting aqueous dispersion then being mixed with the remaining brew ingredients for Phase 1, with the 2—1/2 hr., 80—82°F. fermentation then being carried out, with continuous agitation, as in control Run 1. Proof time for Run 2 was 55 min., all other conditions remaining the same as the control run.

Run 3 was carried out in the same fashion as Run 2, but using 500 g. of Composition B of Example 1. Proof time for Run 3 was 53 min., all other conditions remaining unchanged.

In both Run 2 and Run 3, the agitation of the 4,000 g. water and 500 g. of Compositions A and B, respectively, was carried out in a 5-gallon container with the rotary agitator driven at such a rate that a substantial vortex is generated so that air adequate for lipoxidase activity is continuously introduced into the liquid.

The loaves of white bread produced by Runs 2 and 3 were markedly superior to those from the control run as to volume, body, flavor, grain, texture and crumb color. The loaves from control Run 1 had an average volume of 2656 cc., and those from Runs 2 and 3 had average volumes of 2738 cc. and 2745 cc., respectively. The control loaves had a bland flavor. The bread from Runs 2 and 3 had excellent flavor and aroma, with the flavor of the bread from Run 3 being significantly stronger than the flavor of the bread from Run 2. Judged by several persons of long experience in scoring bread, the loaves from Run 3 were characterized as superior to any continuous-mix bread previously seen by the scorers, insofar as general appearance and internal characteristics were concerned.

Example 4

The laboratory-scale apparatus known as a DO-CORDER and manufactured by Brabender Instrument Corporation, South Hackensack, New Jersey, was employed. This apparatus is a batch type mixing device including a mixing chamber which can be sealed, so as to eliminate exposure of the contents of the chamber to oxygen, and which is equipped with mixing blades driven by an electric motor in such fashion that the device can be operated at a specified speed in r.p.m. The DO-CORDER is actually a modified form of the Brabender farinograph, the modifications being to make the farinograph suitable for simulating full scale continuous-mix dough making procedures. The commercial continuous-mix method was simulated, employing the following formula:

Brew

Ingredient	Parts by Weight
Water	1000.0
Sugar	90.0
Flour	75.0
Yeast	45.0
Salt	30.0
Yeast food	9.0
Monocalcium phosphate	2.0
Mold inhibitor	1.5

DOUGH

Flour	530.0
Brew	450.0
Shortening	17.0
Oxidant: 50 p.p.m. potassium bromate + 10 p.p.m. potassium iodate	

Two runs were made, the first (as control) without addition of any bread improver composition in accordance with the invention, the second with 15 g. of Composition B of Example 1 added to 100 g. of brew water intially and agitated with a propeller-type rotary agitator for 10 min. at a temperature of 85°F. and a pH of 5.5 adjusted with monocalcium phosphate. The bread from the second run was found to have significantly better body and flavor than that from the control run.

So long as the compositions employ at least 3% by weight of the enzyme-peroxidizable fat and at least 5% by weight of a suitable source of active lipoxidase, and so long as the aqueous medium is agitated sufficiently to provide a continuous supply of air for peroxidation of the oil by the lipoxidase, sufficient peroxidation of the fat occurs to provide the desired improvements in the baked products. In general, considering the types of tanks and rotary agitators with which bakeries are usually equipped, rotary agitator speeds in excess of 75 r.p.m., typically 100—150 r.p.m., are adequate to provide both adequate dispersion and an adequate supply of air. Employing the compositions and process conditions hereinbefore specified, the fat content of the composition employed is peroxidized, as a result of lipoxidase activity, to such an extent that there is provided in the aqueous system of the dough a peroxide content, stated in terms of hydrogen peroxide equivalents, of 2—60 parts per million based on the weight of wheat flour in the dough.

WHAT WE CLAIM IS:—

1. In the method for producing baked goods by preparing an aqueous liquid yeast-fermented composition in the nature of a brew or broth, mixing the liquid composition with dough-forming ingredients including at least flour and shortening to provide a preliminary dough mixture, working the dough mixture to develop a completed dough, and proofing and baking the dough, the improvement comprising adding to at least part of the water for the liquid composition a free-flowing uniform admixture of a particulate solid active lipoxidase-bearing material, an enzyme peroxidizable fat, and a finely particulate edible extender material which is inert with respect to said lipoxidase-bearing material and to said fat, said fat being present in said admixture in the form of a thin film on the surfaces of the solid particles of said admixture, said lipoxidase-bearing material constituting 5—85% of the total weight of said admixture, said extender material constituting 10—70% of the total weight of said admixture, and said enzyme-peroxidizable fat constituting 3—30% of the total weight of said admixture; and agitating the resulting mixture to distribute the particles of said admixture through the water and to cause at least a major proportion of said fat to be removed from said solid particles and dispersed in the water to form an oil-in-water emulsion which is markedly more stable than would be the case if the fat were introduced separately and in which the dispersed fat is more finely subdivided than if it were separately introduced, said admixture being employed in a proportion which provides an amount of fat equal to 0.025—0.3% of the total weight of flour employed.

2. A method according to claim 1, wherein said lipoxidase-bearing material is soy flour having a substantial native fat content, the native fat content of said soy flour constituting a proportion of enzyme-peroxidizable fat in addition to the fat present in said solid particles.

3. A method according to claim 1, wherein said fat amounts to 0.040—0.100% of the total flour weight.

4. A method according to claim 1, wherein said extender material is a starchy cereal product having an average particle size of 50—175 microns, and said lipoxidase-bearing material is a legume flour.

5. A method according to claim 4, wherein said extender material is a partially dextrinized corn endosperm flour.

6. A method according to claim 1, wherein the baked product is white bread of improved body and flavor and the dough is prepared in accordance with the continuous-mix procedure of preparing an aqueous yeast-fermented brew, combining the brew continuously with dough-

forming ingredients comprising at least flour and shortening to provide a preliminary dough mixture, and continuously subjecting the preliminary dough mixture to a short-time, high-energy working step to develop a completed dough, and said free-flowing composition is dispersed in at least a portion of the water for the brew.

7. A method according to claim 6, wherein said extender material is a water-imbibing starchy cereal product having an average particle size of 50—175 microns.

8. A method according to claim 1, wherein the step of agitating said resulting mixture is carried out while maintaining the same at a temperature of 40—110°F. and a pH of at least 4.0 but not materially above 8.5.

9. A method according to claim 1, substantially as hereinbefore described with reference to the Examples.

10. A bread improving composition comprising a free-flowing admixture of 10—70% by weight of a solid, finely particulate, edible extender material; 5—85% by weight of a solid, finely particulate, active lipoxidase-bearing material; and 3—30% by weight of an enzyme-peroxidizable fat, said fat being distributed on and supported by the particles of at least said extender material, said composition being capable of surviving prolonged storage without rancidification of said fat or excessive decrease in the lipoxidase activity of said lipoxidase-bearing material, said fat being readily dispersed to form a stable oil-in-water emulsion when said composition is agitated in an aqueous medium.

11. A composition according to claim 10, wherein said fat is a vegetable oil, and said extender material is a starchy cereal product having an average particle size of 50—175 microns.

12. A composition according to claim 11, wherein said extender material is a partially dextrinized corn endosperm flour having an average particle size of 75—150 microns.

13. A composition according to claim 11, wherein said vegetable oil is soybean oil, and said lipoxidase-bearing material is full fat soybean flour, the native fat of said soybean flour constituting a proportion of enzyme-peroxidizable fat in addition to said soybean oil carried by said solid particles.

14. A composition according to claim 10, wherein said fat is at least predominantly carried by said extender material.

15. Baked goods whenever prepared by a method as claimed in any of claims 1 to 9.

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